

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1 (currently amended). A digital image album layout system comprising:

a page creator module operable to receive a set of images, a plurality of different user album preferences, and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences, and to generate album preference criteria using said user album preferences and album preference importance values, said page creator module having a first genetic engine operable to execute genetic evolution calculations on a first genetic population of album criteria, said page creator module having a page evaluation module operable to test said first genetic population for fitness to said album preference criteria, said page creator module being operable to distribute said images to a plurality of album pages responsive to said testing for fitness to said album preference criteria;

an image placement module operable to receive the set of images, a plurality of different user page preferences, and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences, and to generate page preference criteria using said user page preferences and page preference importance values, said ~~page creator~~ image placement module having a second genetic engine operable to execute genetic evolution calculations on a second genetic population of page layout criteria, said image placement module having a layout evaluation module operable to test said second genetic population for fitness to said page preference criteria, said image placement module being operable to distribute said images on respective said album pages responsive to said testing for fitness to said page preference criteria;

wherein said page creator module and said image placement module operate separately.

2 (previously presented). An automated album layout method responsive to a set of inputs containing digital images, graphics, and other 2-dimensional objects, comprising the steps of:

receiving pluralities of user album preferences and album preference importance values, said user album preferences indicating parameter values including at least one of balance, emphasis, chronology, and unity, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

generating a fitness function based upon said user album preferences and said album preference importance values;

evaluating a grouping of the image objects for distribution into a number of album pages using a genetic algorithm, according to said fitness function;

assigning each said image object to a page based on said evaluating; displaying said page for user viewing, and refining the distribution based on further user action.

3 (previously presented). An automated layout and presentation method responsive to a set of inputs containing digital images, graphics, and other two-dimensional objects, comprising the steps of:

receiving pluralities of user page preferences and page preference importance values, said user page preferences indicating parameter values including at least one of white space, overlap, rotation, spatial balance, rotational balance, border symmetry, and emphasis, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

generating a fitness function based upon said user page preferences and said page preference importance values;

evaluating the 'x' and 'y' position coordinates, scale, and rotation of each of the input images objects within a page using a genetic algorithm, according to said fitness function;

creating a page layout based on said evaluating;

displaying said page layout for user viewing;

refining said page layout based on further user action, and  
formatting the page layout printing.

4 (previously presented). A system for assigning a plurality of images to album pages, comprising:

means for receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

means for specifying an initial set of page assignments of said images to a genetic population;

a genetic engine operable to evolve said genetic population to produce a present set of image page assignments;

a page evaluation module operable to generate an album fitness function using said user album preferences and album preference importance values and to test said present set of image page assignments according to said album fitness function to determine an album score, and

means for outputting said present set of image page assignments if said album score meets an album threshold value.

5 (previously presented). A system for arranging a plurality of images on an album page, comprising:

means for receiving a plurality of different user page preferences and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

means for specifying an initial set of image placement parameters of the images to a genetic population;

a genetic engine operable to evolve said genetic population to produce a present set of image placement parameters;

a layout evaluation module operable to generate a page fitness function using said user page preferences and page preference importance values and to test said present set of image placement parameters with a said page fitness function to determine a page score; and

a means for outputting said present set of image placement parameters if said page score meets a page threshold value.

6 (previously presented). A system for assigning and placing a plurality of images on album pages, comprising:

means for receiving a plurality of user album preferences and a plurality of album preference importance values, said user album preferences indicating parameter values including at least one of balance, emphasis, chronology, and unity, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

means for specifying an initial set of page assignments of the images to a first genetic population;

a first genetic engine operable to evolve said first genetic population to produce a present set of image page assignments;

a page evaluation module operable to generate an album fitness function using said user album preferences and album preference importance values and to test said present set of image page assignments according to said album fitness function to determine an album score;

means for outputting said present set of image page assignments if said album score meets an album threshold value;

means for receiving a plurality of user page preferences and a plurality of page preference importance values, said user page preferences indicating parameter values including at least one of white space, overlap, rotation, spatial balance, rotational balance, border symmetry, and emphasis, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

means for specifying an initial set of placement parameters of the images to a second genetic population in accordance with said outputted set of image page assignments;

a second genetic engine operable to evolve said second genetic population to produce a present set of image placement parameters;

a layout evaluation module operable to generate a page fitness function using said user page preferences and page preference importance values and to test said present set of image placement parameters with a said page fitness function to determine a page score, and

means for outputting said image placement parameters if said page score meets a page threshold value.

7 (previously presented). A method of assigning a plurality of images to album pages, comprising the steps of:

receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

specifying an initial set of page assignments of the images to a genetic population;

evolving said genetic population to produce a present set of image page assignments;

generating an album fitness function using said user album preferences and album preference importance values;

testing said present set of image page assignments according to said album fitness function to determine an album score, and

outputting said present set of image page assignments if said album score meets an album threshold value.

8 (previously presented). A method of assigning a plurality of images, having image parameters, to one or more pages in an album, comprising the steps of:

receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences;

specifying an initial set of page assignments defining the album page assignment for each of the plurality of images;

initializing a genetic population by assigning said initial set of page assignments to genes within an album genome structure;

evolving said genetic population in accordance with a genetic function to produce a present set of page assignments within said album genome structure;

calculating a present set of page criteria according to said present set of page assignments, the image parameters, and a set of album page parameters;

generating an album fitness function using said user album preferences and album preference importance values;

testing said present set of page criteria according to said album fitness function to determine an album score;

repeating said evolving and calculating steps if said album score fails to meet an album threshold value, and

outputting image page assignments according to said present page assignment if said album score meets said album threshold value.

9 (previously presented). The method of Claim 8 wherein said image parameters include an image event value, image chronology value, and image emphasis value.

10 (previously presented). The method of Claim 8 wherein said genome structure is a tree structure.

11 (previously presented). The method of Claim 8 wherein said genome structure is selected from one of a tree structure, an array structure, or a list structure.

12 (previously presented). A method of assigning a plurality of images, having image parameters, to one or more pages in an album, comprising the steps of:

receiving a plurality of user album preferences and a plurality of album preference importance values, said user album preferences indicating parameter values including at least one of balance, emphasis, chronology, and unity, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

specifying an initial set of page assignments defining the album page assignment for each of the plurality of images;

initializing a genetic population by assigning said initial set of page assignments to genes within an album genome structure;

evolving said genetic population in accordance with a genetic function to produce a present set of page assignments within said album genome structure;

calculating a present set of page criteria according to said present set of page assignments, the image parameters, and a set of album page parameters;

generating an album fitness function using said user album preferences and album preference importance values;

testing said present set of page criteria according to said album fitness function to determine an album score;

repeating said evolving and calculating steps if said album score fails to meet an album threshold value, and

outputting image page assignments according to said present page assignment if said album score meets said album threshold value;

wherein said evolution step genetic function includes a genetic mutation function and a genetic crossover function.

13 (previously presented). The method of Claim 8 wherein calculation of said page criteria includes calculation of an emphasis value range, a page count value, and a balance threshold value.

14 (previously presented). A method of assigning a plurality of images, having image parameters, to one or more pages in an album, comprising the steps of:

receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

specifying an initial set of page assignments defining the album page assignment for each of the plurality of images;

initializing a genetic population by assigning said initial set of page assignments to genes within an album genome structure;

evolving said genetic population in accordance with a genetic function to produce a present set of page assignments within said album genome structure;

calculating a present set of page criteria according to said present set of page assignments, the image parameters, and a set of album page parameters;

generating an album fitness function using said user album preferences and album preference importance values;

testing said present set of page criteria according to an album fitness function to determine an album score;

repeating said evolving and calculating steps if said album score fails to meet an album threshold value, and

outputting image page assignments according to said present page assignment if said album score meets said album threshold value;

wherein said testing step further comprises the steps of:

comparing said present set of page criteria and respective said user album preferences to generate preliminary album scores and

scaling said preliminary album scores in accordance with respective said album preference importance values to produce a final album score.

15 (previously presented). The method of Claim 14 wherein said page criteria include balance, emphasis, chronology, and unity.



16 (cancelled).

17 (previously presented). A method of arranging a plurality of images on an album page, comprising the steps of:

receiving a plurality of different user page preferences and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

specifying an initial set of image placement parameters of the images to a genetic population;

evolving said genetic population to produce a present set of image placement parameters;

generating a page fitness function based upon said user page preferences and said page preference importance values;

testing said present set of image placement parameters with said page fitness function to determine a page score; and

outputting said image placement parameters if said page score meets a page threshold value.

18 (previously presented). A method of arranging one or more images, having image parameters, on an album page, comprising the steps of:

receiving a plurality of different user page preferences and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

specifying an initial set of positioning parameters for each of the one or more images;

initializing a genetic population by assigning said initial set of positioning parameters as genes in a page genome structure;

evolving said genetic population in accordance with a genetic function to produce a present set of positioning parameters within said page genome structure;

calculating a set of present layout criteria, according to said present set of positioning parameters, the image parameters, and a set of page layout parameters;

generating a page fitness function based upon said user page preferences and said page preference importance values;

testing said present set of layout criteria according to a said page fitness function to determine a page score;

repeating said evolving and calculating steps if said page score fails to meet a page threshold value; and

outputting a page layout according to said present set of positioning parameters if said page score meets said page threshold value.

19 (previously presented). The method of Claim 18 wherein said image parameters include an image emphasis value.

20 (previously presented). The method of Claim 18 wherein said genome structure is an array.

21 (previously presented). The method of Claim 18 wherein said genome structure is selected from one of a tree structure, an array structure or a list structure.

22 (previously presented). A method of arranging one or more images, having image parameters, on an album page, comprising the steps of:

receiving a plurality of different user page preferences and a plurality of page preference importance values, said user page preferences indicating parameter values including at least one of white space, overlap, rotation, spatial balance, rotational balance, border symmetry, and emphasis, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

specifying an initial set of positioning parameters for each of the one or more images;

initializing a genetic population by assigning said initial set of positioning parameters as genes in a page genome structure;  
evolving said genetic population in accordance with a genetic function to produce a present set of positioning parameters within said page genome structure;  
calculating a set of present layout criteria, according to said present set of positioning parameters, the image parameters, and a set of page layout parameters;  
generating a page fitness function based upon said user page preferences and said page preference importance values;  
testing said present set of layout criteria according to a page fitness function to determine a page score;  
repeating said evolving and calculating steps if said page score fails to meet a page threshold value; and  
outputting a page layout according to said present set of positioning parameters if said page score meets said page threshold value;  
wherein said evolution step genetic function includes a genetic mutation function and a genetic crossover function.

23 (previously presented). The method of Claim 18 wherein calculation of said layout criteria includes calculation of at least one of white space area, image overlap, image rotation, spatial balance, rotational balance, border symmetry, and image emphasis values.

24 (previously presented). A method of arranging one or more images, having image parameters, on an album page, comprising the steps of:  
receiving a plurality of different user page preferences and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,  
specifying an initial set of positioning parameters for each of the one or more images;

initializing a genetic population by assigning said initial set of positioning parameters as genes in a page genome structure;  
evolving said genetic population in accordance with a genetic function to produce a present set of positioning parameters within said page genome structure;  
calculating a set of present layout criteria, according to said present set of positioning parameters, the image parameters, and a set of page layout parameters;  
generating a page fitness function based upon said user page preferences and said page preference importance values;  
testing said present set of layout criteria according to said page fitness function to determine a page score;  
repeating said evolving and calculating steps if said page score fails to meet a page threshold value; and  
outputting a page layout according to said present set of positioning parameters if said page score meets said page threshold value;  
wherein said testing step further comprises the steps of:  
comparing said layout criteria to layout preference criteria and generating a preliminary page score and  
scaling said preliminary page score in accordance with page importance parameters to produce a final page score.

25 (previously presented). The method of Claim 18 wherein said page criteria include at least one of page size, maximum image rotation, scaling range, white space range, overlap range, and border deviation.

26 (previously presented). The method of Claim 24 wherein said layout preference criteria are based upon user preferences.

27 (currently amended). A method of assigning and placing a plurality of images on album pages, comprising the steps of:

receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference

importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

specifying an initial set of page assignments of the images to a first genetic population;

evolving said first genetic population to produce a present set of image page assignments;

generating an album fitness function based upon said user album preferences and said album preference importance values;

testing said present set of image page assignments according to said album fitness function to determine an album score;

outputting said present set of image page assignments if said album score meets an album threshold value;

receiving a plurality of different user page preferences, and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

specifying an initial set of placement parameters of the images to a second genetic population in accordance with said outputted set of image page assignments;

evolving said second genetic population to produce a present set of image placement parameters;

generating a page fitness function based upon said user page preferences and said page preference importance values;

testing said present set of image placement parameters with a page fitness function to determine a page score; and

outputting said image placement parameters if said page score meets a page threshold value;

wherein said evolving of said first genetic population, said generating of said album fitness function, and said testing according to said album fitness function are separate from said evolving of said second genetic population, said generating of said page fitness function, and said testing with said page fitness function.

28 (previously presented). The method of claim 7, further comprising the step of:

repeating said evolving and testing steps if said album score fails to meet said album threshold value.

29 (previously presented). The system of claim 1, wherein the genetic evolution calculations performed by at least one of the first and second genetic engines include the application of a genetic mutation function.

30 (previously presented). The system of claim 1, wherein the genetic evolution calculations performed by at least one of the first and second genetic engines include the application of a genetic crossover function.

31 (previously presented). The method of claim 7, wherein the step of evolving said genetic population includes the application of a genetic mutation function.

32 (previously presented). The method of claim 7, wherein the step of evolving said genetic population includes the application of a genetic crossover function.

33-36 (cancelled).